

Application No. 10/694,166
Filed: October 27, 2003
TC Art Unit: 2181
Confirmation No.: 3061

AMENDMENT TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An apparatus for enabling communications between ~~a computer and a battery-powered device, each having an interface for sending and receiving respective data signals and for providing a respective power signal, the electrical operating ranges of the USB interface of a computer provided and a battery-powered device provided power signals being dissimilar~~ not having a USB port, the apparatus comprising:

a microcomputer module ~~comprising an~~ having a USB-compliant module interface for exchanging data signals with the computer and for receiving the power signal from the computer, a microcomputer for controlling the exchange of data via the module interfaces signals, and a memory element for storing microcomputer operating instructions and data processed thereby, the microcomputer operating in the electrical operating range of the computer and selectively reformatting data in accordance with the formatting requirements of the computer and the battery-powered device, respectively; and

a bridging module in communication with the microcomputer of the microcomputer module and the battery-powered device and adapted to ~~compensate for~~ accommodate the dissimilar electrical operating ranges of ~~data exchanged between both~~ the computer and the battery-powered device ~~via the bridging module~~,

whereby data transmitted by the computer via the ~~computer-USB~~ interface is received at the microcomputer via the module interface, selectively reformatted by the microcomputer, and

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transmitted to the battery-powered device via the bridging
| ~~element~~ module, and

whereby data transmitted by the battery-powered device is
received at the microcomputer module via the bridging element,
selectively reformatted by the microcomputer, transmitted to the
computer by the module interface, and received by the computer via
| the ~~computer~~ USB interface.

2. (Currently Amended) The apparatus of claim 1, wherein the
| ~~bridging module is operative to modify at least a portion of the~~
~~exchanged data into a form compatible with the electrical~~
~~operating range associated with the computer or battery-powered~~
~~device receiving the exchanged data~~ operates at a voltage
substantially different from that of the microprocessor.

3. (Currently Amended) The apparatus of claim 2 ~~1~~ wherein the
| ~~bridging module comprises a level shifting circuit to alter the~~
~~amplitude of at least a portion of the exchanged data into a form~~
~~compatible with the electrical operating range associated with~~
communication between the computer or and the battery-powered
device receiving is initiated by the exchanged data computer.

4. (Currently Amended) The apparatus of claim 3 ~~1~~, wherein the
| ~~level shifting circuit~~ bridging module comprises:

a direct electrical connection for conveying data from the
battery-powered device to the microcomputer module; and

an electrical connection including a level shifting circuit
to reduce the amplitude of the data conveyed from the
microcomputer module to the battery-powered device.

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5. (Currently Amended) The apparatus of claim 4 wherein the ~~level shifting circuit is a voltage divider circuit~~communication between the computer and the battery-powered device uses a communication protocol with at least one transition per bit cell.

6. (Currently Amended) The apparatus of claim 25 wherein the ~~bridging module comprises a wireless communications link between the microcomputer module and the battery powered device~~level-shifting circuit is a voltage divider circuit.

7. (Currently Amended) The apparatus of claim 16 wherein the ~~bridging module comprises a wireless communications link comprises an optical transmitter and receiver in communication with each of~~between the microcomputer module and the battery-powered device.

8. (Currently Amended) The apparatus of claim 67 wherein the wireless communications link comprises an ~~RF~~optical transmitter and ~~RF~~optical receiver in communication with each of the microcomputer module and the battery-powered device.

9. (Currently Amended) The apparatus of claim 27 wherein the ~~bridging module comprises a fiber coupled optical~~wireless communications link comprises an RF transmitter and RF receiver in communication with each of the microcomputer module and the battery-powered device.

10. (Currently Amended) The apparatus of claim 1 wherein the ~~computer interface is a USB interface and the module interface is~~

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a USB compliant interface bridging module comprises a fiber-coupled optical communications link.

11. (Currently Amended) The apparatus of claim 1, wherein the ~~microcomputer is operative to store data in the memory element prior to transmitting it to the computer or the battery-powered~~ device, bridging module, and microcomputer module are disposed in a common enclosure.

12. - 16. (Canceled)

17. (Original) The apparatus of claim 1, wherein the bridging module and the microcomputer module are disposed in a first enclosure selectively coupleable to the computer and to the battery-powered device.

18. (Canceled)

19. (Original) The apparatus of claim 1, wherein the microcomputer module further comprises a power supply for enabling microcomputer operation independent of the computer-provided power signal.

20. - 29. (Canceled)

30. (New) The apparatus of claim 1, wherein the microcomputer module provides USB enumeration information from the battery-powered device to the computer if the microcomputer module is in communication with the battery-powered device and different USB

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enumeration information if the microcomputer module is not in communication with the battery-powered device.

31. (New) A USB-compatible battery-powered device, comprising:

a battery having a first voltage level;

a first microcomputer powered by the battery;

a bridging circuit in communication with the first microcomputer; and

a USB interface module, comprised of a second microcomputer and an associated USB-compliant interface, the USB interface module being in communication with the bridging circuit and being in selective communication with a computer via a USB connection,

whereby the second microprocessor is selectively powered by a power signal associated with the USB connection, the power signal having a second voltage level different from the first voltage level.

32. (New) The device of claim 31, wherein the bridging circuit is adapted to compensate for the different first and second voltage levels, thereby enabling data exchange between the first and second microcomputers.

33. (New) The device of claim 32, wherein the bridging circuit is comprised of a level shifting circuit.

34. (New) The device of claim 31, further comprising a sensor for providing sensor data to the first microprocessor.

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35. (New) The device of claim 31 wherein the bridging circuit comprises a wireless communications link between the first microcomputer and the USB interface module.

36. (New) The device of claim 35 wherein the wireless communications link comprises an optical transmitter and optical receiver in communication with each of the first microcomputer and the USB interface module.

37. (New) The device of claim 35 wherein the wireless communications link comprises an RF transmitter and RF receiver in communication with each of the first microcomputer and the USB interface module.

38. (New) The device of claim 31 wherein the bridging circuit comprises a fiber-coupled optical communications link.